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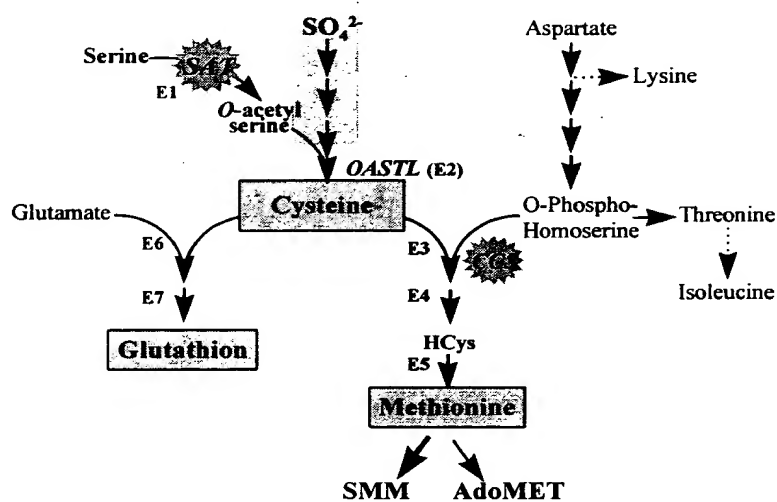


Figure 1 : Séquence illustrant la voie de synthèse de la cystéine et des dérivés soufrés (glutathion et méthionine).

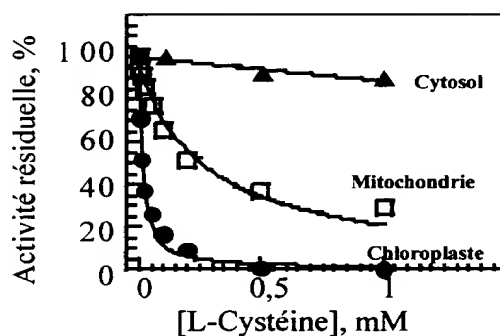


Figure 2 : Effet de la cystéine sur les activités sérine acétyltransférase de pois (*Pisum sativum*).

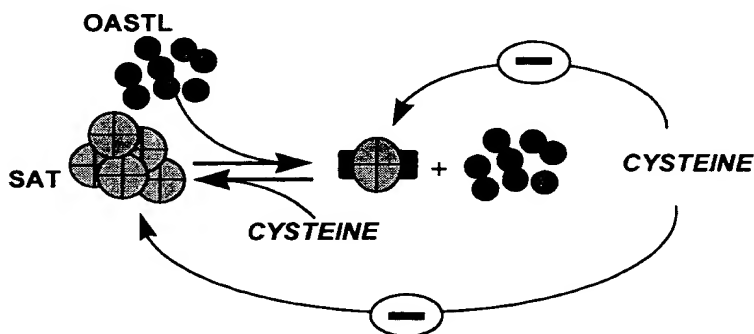


Figure 3 : Modèle de l'inhibition de la sérine acétyltransférase chloroplastique.

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M	A	T	C	I	D	I	C	R	T	G	N	T	Q	D	D	18	
ATG	GCA	ACA	TGC	ATA	GAC	ACA	TGC	CGA	ACC	GGT	AAT	ACC	CAA	GAC	GAT	48	
D	S	R	F	C	C	I	K	N	F	F	R	P	G	F	S	84	
GAT	TCC	CGG	TTC	TGT	TGC	ATC	AAG	AAT	TTC	TTT	CGA	CCC	GGT	TTC	TCT	96	
V	N	R	K	I	H	H	T	Q	I	E	D	D	D	D	V	144	
GTA	AAC	CGG	AAG	ATT	CAC	CAC	ACC	CAA	ATC	GAA	GAT	GAC	GAT	GAT	GTC	144	
W	I	K	M	L	E	E	A	K	S	D	V	K	Q	E	P	192	
TGG	ATC	AAG	ATG	CTT	GAA	GAA	GCC	AAA	TCC	GAT	GTT	AAA	CAA	GAA	CCC	192	
I	L	S	N	Y	Y	Y	A	S	I	T	S	H	R	S	L	240	
ATT	TTA	TCA	AAC	TAC	TAC	TAC	GCT	TCG	ATC	ACA	TCT	CAT	CGA	TCT	TTA	240	
E	S	A	L	A	H	I	L	S	V	K	L	S	N	L	N	288	
GAG	TCT	GCT	TTA	GCT	CAC	ATC	CTC	TCC	GTA	AAG	CTC	AGC	AAT	TTA	AAC	288	
L	P	S	N	T	L	F	E	L	F	I	S	V	L	E	E	336	
CTA	CCA	AGC	AAC	ACA	CTC	TTC	GAA	CTG	TTC	ATA	AGC	GTT	TTA	GAA	GAA	336	
S	P	E	I	I	E	S	T	K	Q	D	L	I	A	V	K	384	
AGC	CCT	GAG	ATC	ATC	GAA	TCC	ACG	AAG	CAA	GAT	CTT	ATA	GCA	GTC	AAA	384	
E	R	D	P	A	C	I	S	Y	V	H	C	F	L	G	F	432	
GAA	AGA	GAC	CCA	GCT	TGT	ATA	AGC	TAC	GTT	CAT	TGC	TTC	TTG	GGC	TTC	432	
K	G	F	L	A	C	Q	A	H	R	I	A	H	T	L	W	480	
AAA	GGC	TTC	CTC	GCT	TGT	CAA	GCT	CAT	CGA	ATA	GCT	CAT	ACC	CTC	TGG	480	
K	Q	N	R	K	I	V	A	L	L	I	Q	N	R	V	S	528	
AAA	CAG	AAC	AGA	AAA	ATC	GTA	GCT	TTA	TTG	ATC	CAA	AAC	AGA	GTA	TCA	528	
E	S	F	A	V	D	I	E	P	G	A	K	I	G	K	G	576	
GAA	TCT	TTC	GCC	GTC	GAT	ATT	CAT	CCC	GGA	GCG	AAG	ATC	GGA	AAA	GGG	576	
I	L	L	D	H	A	T	G	V	V	I	G	E	T	A	V	624	
ATT	CTT	TTA	GAC	CAT	GCG	ACG	GGC	GTG	GTG	ATC	GGA	GAG	ACG	GCG	GTG	624	
V	G	D	N	V	S	I	L	H	G	V	T	L	G	G	T	672	
GTT	GGA	GAC	AAT	GTT	TCG	ATT	CTA	CAC	GGA	GTG	ACC	TTG	GGA	GGA	ACA	672	
G	K	Q	S	G	D	R	H	P	K	I	G	D	G	V	L	720	
GGG	AAA	CAG	AGT	GGT	GAT	CGG	CAT	CCG	AAG	ATT	GGT	GAT	GGT	GTG	TTG	720	
I	G	A	G	S	C	I	L	G	N	I	T	I	G	E	G	768	
ATT	GGA	GCT	GGG	AGT	TGT	ATA	TTG	GGG	AAT	ATA	ACA	ATC	GGT	GAG	GGA	768	
A	K	I	G	S	G	S	V	V	V	K	D	V	P	A	R	816	
GCT	AAG	ATT	GGA	TCA	GGG	TCG	GTG	GTG	GTT	AAG	GAT	GTG	CCG	GCG	CGT	816	
T	T	A	V	G	N	P	A	R	L	I	G	G	K	E	N	864	
ACG	ACG	GCG	GTT	GGA	AAT	CCG	GCG	AGG	TTG	ATT	GGT	GGG	AAA	GAG	AAT	864	
P	R	K	H	D	K	I	P	C	L	T	M	D	Q	T	S	912	
CCG	AGA	AAA	CAT	GAT	AAG	ATT	CCT	TGT	CTG	ACT	ATG	GAC	CAG	ACA	TCG	912	
Y	L	T	E	W	S	D	Y	V	I							945	
TAT	TTA	ACC	GAG	TGG	TCT	GAT	TAT	GTG	ATT	TAA						945	

Figure 4: Séquence nucléotidique et peptidique du gène de l'isoforme SAT 3 (L34076) d'A.

thaliana

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		M	P	P	A	G	E	L	R	H	Q	S	P	S	K	14
		ATG	CCA	CCG	GCC	GGA	GAA	CTC	CGA	CAT	CAA	TCT	CCA	TCA	AAG	42
E	K	L	S	S	V	T	Q	S	D	E	A	E	A	A	S	30
GAG	AAA	CTA	TCT	TCC	GTT	ACC	CAA	TCC	GAT	GAA	GCA	GAA	GCA	GCG	TCA	90
A	A	I	S	A	A	A	A	D	A	E	A	A	G	L	W	46
GCA	GCG	ATA	TCT	GCG	GCA	GCT	GCA	GAT	GCG	GAA	GCT	GCC	GGA	TTA	TGG	138
T	Q	I	K	A	E	A	R	D	A	E	A	E	A	P	A	62
ACA	CAG	ATC	AAG	GCG	GAA	GCT	CGC	CGT	GAT	GCT	GAG	GCG	GAG	CCA	GCT	186
L	A	S	Y	L	Y	S	T	I	L	S	H	S	S	L	E	78
TTA	GCT	AGC	TAT	CTA	TAT	TCG	ACG	ATT	CTT	TCT	CAT	TCG	TCT	CTT	GAA	234
R	S	I	S	F	H	L	G	V	N	L	C	S	S	T	L	94
CGA	TCT	ATC	TCG	TTT	CAT	CTA	GGA	AAC	AAG	CTT	TGT	TCC	TCA	ACG	CTT	282
L	S	T	L	L	Y	D	L	F	L	N	T	F	S	S	D	110
TTA	TCC	ACA	CTT	TTA	TAC	GAT	CTG	TTC	TTA	AAC	ACT	TTT	TCC	TCC	GAT	330
P	S	L	R	N	A	T	V	A	D	L	R	A	A	R	V	126
CCT	TCT	CTT	CGT	AAC	GCC	ACC	GTC	GCA	GAT	CTA	CGC	GCT	GCT	CGT	GTT	378
R	D	P	A	C	I	S	F	S	H	C	L	L	N	Y	K	142
CGT	GAT	CCT	GCT	TGT	ATC	TCG	TTC	TCT	CAT	TGT	CTC	CTC	AAT	TAC	AAA	426
G	F	L	A	I	Q	A	H	R	V	S	H	K	L	W	T	158
GGC	TTC	TTA	GCT	ATT	CAG	GCG	CAT	CGT	GTA	TCA	CAC	AAG	CTA	TGG	ACA	474
Q	S	R	K	P	L	A	L	A	L	H	S	R	I	S	D	174
CAA	TCA	CGG	AAG	CCA	TTA	GCA	TTA	GCT	CTA	CAC	TCA	AGA	ATC	TCC	GAT	522
V	F	A	V	D	I	H	P	A	A	K	I	G	N	G	I	190
GTA	TTC	GCT	GTT	GAT	ATC	CAT	CCA	GCA	GCG	AAG	ATC	GGA	AAA	GGG	ATA	570
L	L	D	H	A	I	G	V	V	V	G	E	T	A	V	I	206
CTT	CTA	GAC	CAC	GCA	ACC	GGA	GTT	GTA	GTC	GGA	GAA	ACA	GCG	GTG	ATT	618
G	N	N	V	S	I	L	H	H	V	T	L	G	G	T	G	222
GGG	AAC	AAT	GTT	TCA	ATC	CTT	CAC	CAT	GTG	ACA	CTA	GGT	GGA	ACA	GGT	666
K	A	C	G	D	R	H	P	K	I	G	D	G	C	L	I	238
AAA	GCT	TGT	GGA	GAT	AGA	CAT	CCG	AAG	ATC	GGT	GAC	GGT	TGT	TTG	ATT	714
G	A	G	A	T	I	L	G	N	V	K	I	G	A	G	A	254
GGA	GCT	GGA	GCG	ACT	ATT	CTT	GGA	AAT	GTG	AAG	ATT	GGT	GCA	GGT	GCT	762
K	V	G	A	G	S	V	/	L	I	D	V	P	C	R	G	270
AAA	GTA	GGA	GCT	GGT	TCT	GTT	GTG	CTG	ATT	GAC	GTG	CCT	TGT	CGA	GGT	810
T	A	V	G	N	P	A	R	L	V	G	G	K	E	K	P	286
ACT	GCG	GTT	GGG	AAT	CCG	GCG	AGA	CTT	GTC	GGA	GGG	AAA	GAG	AAG	CCA	858
T	I	H	D	E	E	C	P	G	E	S	M	D	H	T	S	302
ACG	ATT	CAT	GAT	GAG	GAA	TGT	CCT	GGA	GAA	TCG	ATG	GAT	CAT	ACT	TCA	906
F	I	S	E	W	S	D	Y	I	I...							312
TTC	ATC	TCG	GAA	TGG	TCA	GAT	TAC	ATC	ATA	TAA						939

Figure 5: Séquence nucléotidique et peptidique du gène de l'isoforme SAT3' (U30298) d'A.
thaliana

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M	A	A	C	I	O	T	C	R	T	G	K	F	Q	I		15
ATG	GCT	GCG	TGC	ATC	GAC	ACC	TGC	CGC	ACT	GGT	AAA	CCC	CAG	ATT		45
S	P	R	D	S	S	K	H	H	D	D	E	C	S	F		30
TCT	CCT	CGC	GAT	TCT	TCT	AAA	CAC	CAC	GAC	GAT	GAA	TCT	GGC	TTT		90
R	Y	M	N	Y	F	R	Y	P	D	R	S	S	F	N		45
CGT	TAC	ATG	AAC	TAC	TTC	CGT	TAT	CCT	GAT	CGA	TCT	TCC	TTC	AAT		135
G	F	Q	T	K	T	L	H	I	R	F	L	L	E	I		60
GGA	ACC	CAG	ACC	AAA	ACC	CTC	CAT	ACT	CGT	CCT	TTG	CTT	GAA	GAT		180
L	D	R	D	A	E	V	D	D	V	W	A	K	I	R		75
CTC	GAT	CGC	GAC	GCT	GAA	GTC	GAT	GAT	GTT	TGG	GCC	AAA	ATC	CGA		225
E	E	A	K	S	D	I	A	K	E	P	I	V	S	A		90
GAA	GAG	GCT	AAA	TCT	GAT	ATC	GCC	AAA	GAA	CCT	ATT	GTT	TCC	GCT		270
Y	Y	H	A	S	I	V	S	Q	R	S	L	E	A	A		105
TAT	TAT	CAC	GCT	TCG	ATT	GTT	TCT	CAG	CGT	TCG	TTG	GAA	GCT	GCG		315
L	A	N	T	L	S	V	K	L	S	N	L	N	L	P		120
TTG	GCG	AAT	ACT	TTA	TCT	GTT	AAA	CTC	AGC	AAT	TTG	AAT	CTT	CCA		360
S	N	T	L	F	D	L	F	S	G	V	L	Q	G	N		135
AGC	AAC	ACG	CTT	TTC	GAT	TTG	TTC	TCT	GGT	GTT	CTT	CAA	GGA	AAC		405
P	D	I	V	E	S	V	K	L	D	L	L	A	V	K		150
CCA	GAT	ATT	GTT	GAA	TCT	GTC	AAG	CTA	GAT	CTT	TTA	GCT	GTT	AAG		450
E	R	D	P	A	C	I	S	Y	V	H	C	F	L	H		165
GAG	AGA	GAT	CCT	GCT	TGT	ATA	AGC	TAC	GTT	CAT	TGT	TTC	CTT	CAC		495
F	K	G	F	L	A	C	L	A	H	R	I	A	R	E		180
TTT	AAA	GGC	TTC	CTC	GCT	TGT	CAA	GCG	CAT	CGT	ATT	GCT	CAT	GAG		540
L	W	T	Q	D	R	N	I	L	A	L	I	L	I	N		195
CTT	TGG	ACT	CAG	GAC	AGA	AAA	ATC	CTA	GCT	TTG	TTG	ATC	CAG	AAC		585
R	V	S	E	A	F	A	V	E	F	E	E	G	A	K		210
AGA	GTC	TCT	GAA	GCC	TTC	GCT	GTT	GAT	TTC	CAC	CCT	GGA	GCT	AAA		630
G	F	G	I	L	L	D	H	A	I	A	I	V	L			225
ATC	GGT	ACC	GGG	ATT	TTG	CTA	GAC	CAT	GCT	ACG	GCT	ATT	GTG	ATC		675
L	E	T	A	V	V	G	N	N	V	S	I	L	H	N		240
GGT	GAG	ACG	GCG	GTT	GTG	GGG	AAC	AAT	GTT	TCG	ATT	CTC	CAT	AAC		720
I	T	L	G	G	T	S	K	Q	C	G	D	S	H	P		255
GTT	ACG	CTT	GGA	GGA	ACG	GGG	AAA	CAG	TGT	GGA	GAT	AGG	CAC	CCG		765
I	G	D	G	V	L	I	G	A	G	I	C	I	I	D		270
AAG	ATT	GGC	GAT	GGG	GTT	TTG	ATT	GGA	GCT	GGG	ACT	TGT	ATT	TTG		810
G	N	I	T	I	G	E	G	A	K	I	G	A	G	S		285
GGG	AAT	ATC	ACG	ATT	GGT	GAA	GGA	GCT	AAG	ATT	GGT	GCG	GGG	TCG		855
V	V	L	K	D	V	P	P	R	T	T	A	V	G	N		300
GTG	GTG	TTG	AAA	GAC	GTG	CCG	CCG	CGT	ACG	ACG	GCT	GTT	GGA	AAT		900
E	A	R	L	L	G	G	K	D	N	P	K	I	H	D		315
CCG	GCG	AGG	TTG	CTT	GGT	GGT	AAA	GAT	AAT	CCG	AAA	ACG	CAT	GAC		945
K	I	P	G	L	T	M	D	Q	T	S	H	I	S	E		330
AAG	ATT	CCT	GGT	TTG	ACT	ATG	GAC	CAG	ACG	TCG	CAT	ATA	TCC	GAG		990
E	S	D	Y	V	I											336
TGG	TCG	GAT	TAT	GTA	ATT	TGA										1011

Figure 6: Séquence nucléotidique et peptidique d'un gène de l'isoforme SAT 1' (L78443) d'*A. thaliana*.

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[illegible]

Figure 8: Sequence nucléotidique et peptidique du m RNA de la serine acetyltransferase SAT 2 putative chloroplastique d'*Arabidopsis thaliana* (L78444)

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M	A	C	I	N	G	E	N	R	D	F	S	S	S	S		
ATG	GCT	TGT	ATA	AAC	GGC	GAG	AAT	CGT	GAT	TTT	TCT	TCC	TCG	TCA	15	
S	L	S	S	L	P	M	I	V	S	R	N	F	S	A	45	
TCT	TTG	TCT	TCT	CTT	CCA	ATG	ATT	GTC	TCC	CGG	AAC	TTT	TCT	GCC	30	90
R	D	D	G	E	T	G	D	E	F	P	F	E	R	I	45	
AGA	GAC	GAT	GGA	GAG	ACC	GGT	GAC	GAG	TTT	CCT	TTC	GAG	AGG	ATT	135	
F	P	V	Y	A	R	G	T	L	N	P	V	A	D	P	60	
TTC	CCG	GTT	TAC	GCT	AGA	GGA	ACC	CTT	AAT	CCC	GTG	GCC	GAC	CCG	180	
V	L	L	D	F	T	N	S	S	Y	D	P	I	W	D	75	
GTT	TTG	CTG	GAT	TTT	ACC	AAT	TCT	AGT	TAT	GAC	CCA	ATT	TGG	GAT	225	
S	I	R	E	E	A	K	L	E	A	E	E	E	P	V	90	
TCT	ATA	AGA	GAA	GAA	GCT	AAG	CTT	GAG	GCA	GAA	GAG	GAG	CCG	GTT	270	
L	S	S	F	L	Y	A	S	I	L	S	H	D	C	L	105	
TTG	AGT	AGC	TTC	TTG	TAT	GCT	AGT	ATC	TTG	TCG	CAT	GAC	TGT	TTA	315	
E	Q	A	L	S	F	V	L	A	N	R	L	Q	N	P	120	
GAG	CAA	GCA	TTG	AGT	TTT	GTT	CTA	GCT	AAC	CGT	CTC	CAA	AAC	CCT	360	
T	L	L	A	T	Q	L	M	D	I	F	C	N	V	M	135	
ACC	TTG	TTG	GCA	ACT	CAG	CTT	ATG	GAT	ATA	TTT	TGC	AAC	GTT	ATG	405	
V	H	D	R	G	I	Q	S	S	I	R	L	D	V	Q	150	
GTA	CAT	GAC	AGA	GGT	ATT	CAA	AGC	TCG	ATT	CGT	CTT	GAT	GTT	CAG	450	
A	F	K	D	R	D	P	A	C	L	S	Y	S	S	A	165	
GCA	TTC	AAA	GAC	AGA	GAT	CCT	GCT	TGT	CTA	TCG	TAT	AGT	TCG	GCT	495	
I	L	H	L	K	G	Y	L	A	L	Q	A	Y	R	V	180	
ATT	TTA	CAT	CTG	AAG	GGC	TAT	CTT	GCA	CTG	CAG	GCG	TAT	AGA	GTA	540	
A	H	K	L	W	K	Q	G	R	K	L	L	A	L	A	195	
GCA	CAT	AAG	TTG	TGG	AAG	CAA	GGA	AGA	AAA	CTA	TTA	GCA	TTG	GCA	585	
L	Q	S	R	V	S	E	V	R	T	A	V	I	G	D	210	
CTG	CAA	AGC	CGA	GTA	AGC	GAG	GTA	AGA	ACT	GCT	GTG	ATA	GGC	GAC	630	
R	V	S	I	L	H	G	V	T	L	G	G	T	G	K	225	
CGT	GTC	TCA	ATT	TTG	CAT	GGT	GTG	ACA	TTA	GGA	GGA	ACT	GGG	AAA	675	
E	T	G	D	R	H	P	N	I	G	D	G	A	L	L	240	
GAA	ACC	GGT	GAC	CGC	CAT	CCA	AAT	ATA	GGC	GAC	GGT	GCT	CTT	CTT	720	
G	A	C	V	T	I	L	G	N	I	K	I	G	A	G	255	
GGA	GCA	TGT	GTG	ACT	ATA	CTT	GGT	AAC	ATT	AAG	ATA	GGC	GCT	GGA	765	
A	M	V	A	A	G	S	L	V	L	K	D	V	P	S	270	
GCA	ATG	GTA	GCT	GCT	GGT	TCG	CTT	GTG	TTA	AAG	GAT	GTT	CCT	TCG	810	
H	S	M	V	A	G	N	P	A	K	L	I	G	F	V	285	
CAT	AGC	ATG	GTG	GCT	GGA	AAT	CCA	GCA	AAA	CTC	ATC	GGG	TTT	GTT	855	
D	E	Q	D	P	S	M	T	M	E	H	G	E	S		299	
GAT	GAG	CAA	GAT	CCA	TCT	ATG	ACA	ATG	GAG	CAT	GGT	GAG	TCT	TGA	900	

Figure 9: Sequence nucléotidique et en acides aminés du mRNA de la SAT4 putative chloroplastique d'*Arabidopsis thaliana*.

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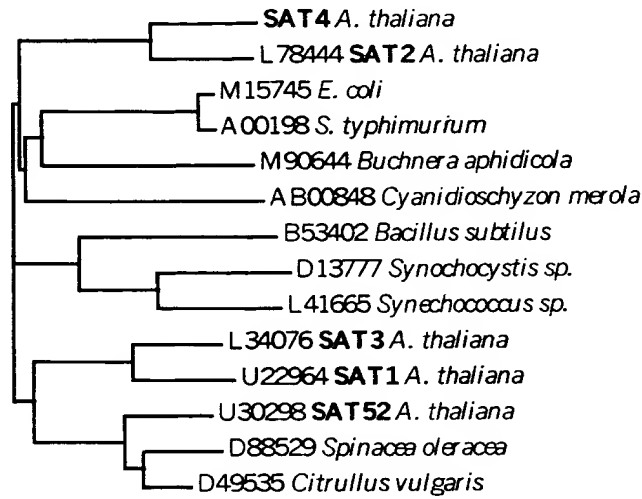


Figure 10 Dendrogramme des serine acétyltransferase issues de plusieurs organismes.

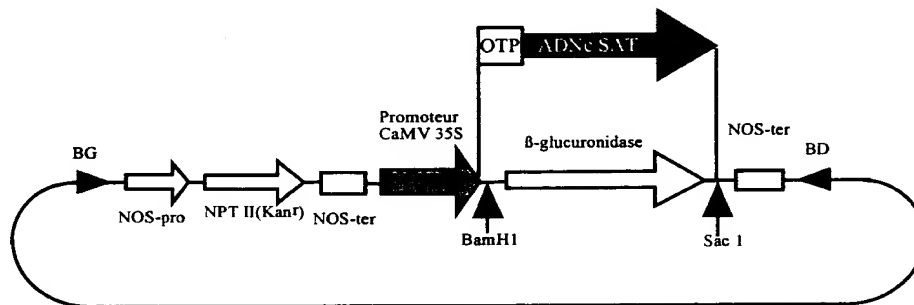


Figure 11: Procédure de clonage de l'OTP/Serine acétyltransférase SAT3 ou SAT (insensible à la cystéine, par exemple SAT1 tronqué) dans le vecteur pBI121.

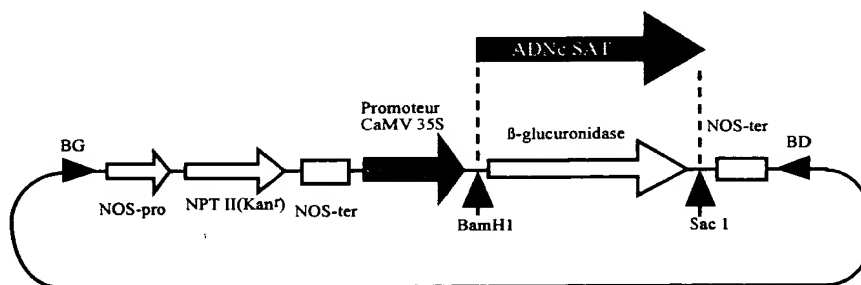


Figure 12: Procédure de clonage de la Serine acétyltransférase SAT1' ; SAT1 ; SAT2 ; SAT3, SAT3' ; SAT4, ou toutes SATs dans le vecteur pBI121.

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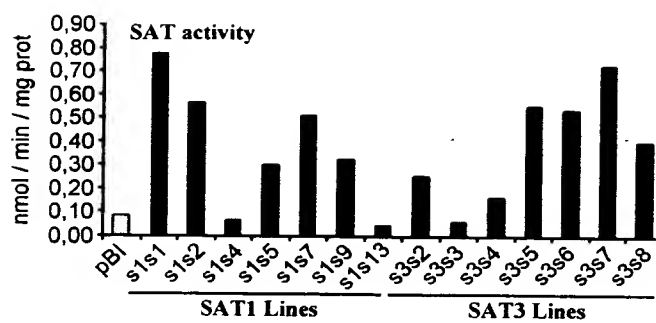


Figure 13

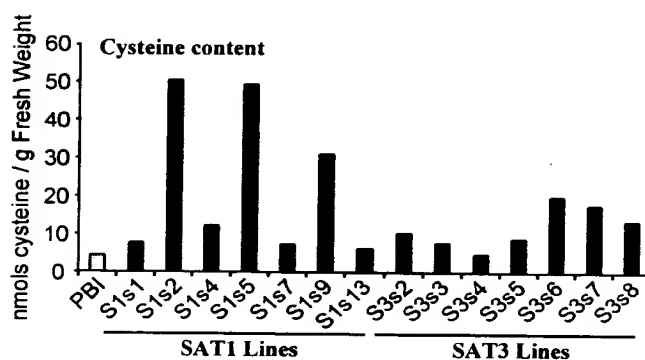


Figure 14

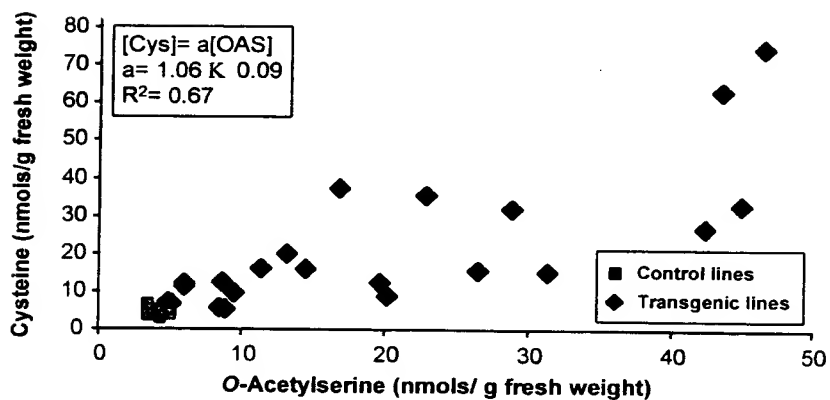


Figure 15

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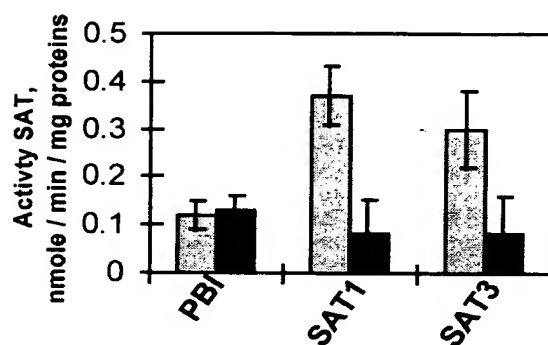


Figure 16

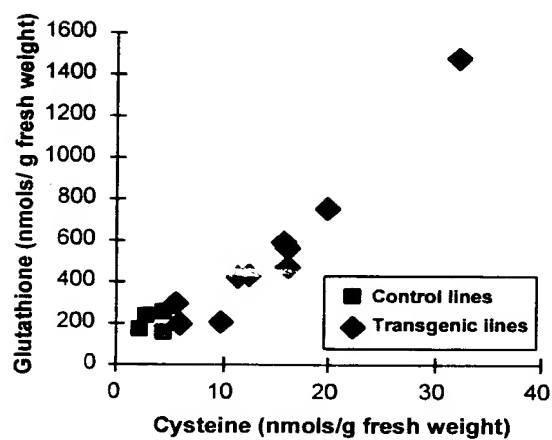


Figure 17

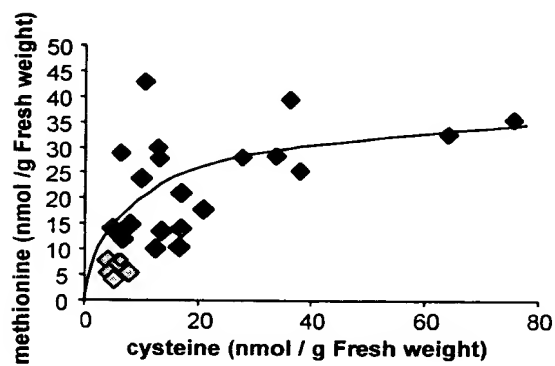


Figure 18

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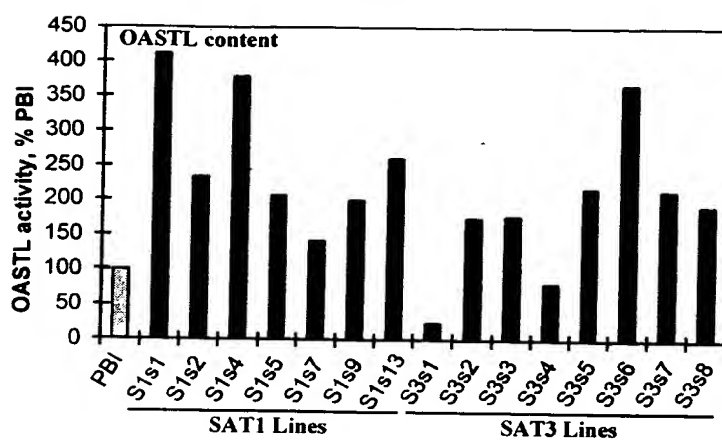


Figure 19

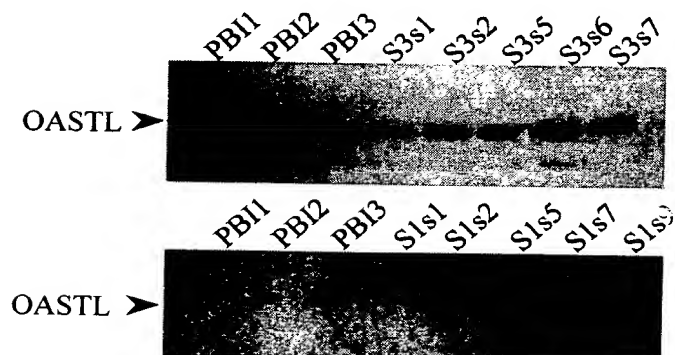


Figure 20

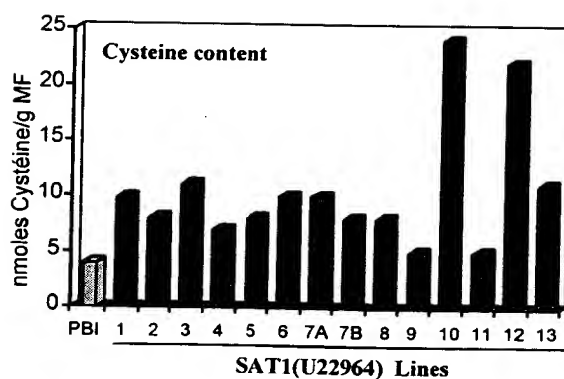


Figure 21

SAT1(U22964)

Glutathione, nmole/g Fresh weight

Cysteine, nmole/g fresh weight

PBI

Cysteine (nmole/g fresh weight)	Glutathione (nmole/g Fresh weight)
4	180
5	280
6	400
7	430
8	480
9	510
10	630
11	510
12	630
22	760
24	720

Figure 22